

REMARKS

The present application was filed on October 5, 2005 with claims 1 through 24. Claims 14-17 were cancelled in the Amendment and Response to Office Action dated October 7, 2008. Claims 1-13 and 18-24 are presently pending in the above-identified patent application.

5 Applicant proposes to amend claims 1, 9, 18, and 19 herein.

In the Office Action, the Examiner rejected claims 1, 4, 7, 8, 18, 21, and 23 under 35 U.S.C. §103(a) as being unpatentable over Muller et al. (United States Patent No. 6,021,132) in view of Sindhu et al. (United States Patent No. 6,493,347), rejected claims 2 and 19 under 35 U.S.C. §103(a) as being unpatentable over Muller et al. and Sindhu et al., in view of Benson et al. (United States Patent No. 6,151,321), rejected claims 3 and 20 under 35 U.S.C. §103(a) as being unpatentable over Muller et al. and Sindhu et al., in view of Kamaraj et al. (United States Patent No. 6,501,757), rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Muller et al. and Sindhu et al., in view of Beshai (United States Publication No. 2004/0184448), rejected claims 6 and 22 under 35 U.S.C. §103(a) as being unpatentable over Muller et al. and Sindhu et al., in view of Lavelle et al. (United States Patent No. 6,812,929), rejected claims 9 and 13 under 35 U.S.C. §103(a) as being unpatentable over Muller et al. in view of Manning et al. (United States Patent No. 6,088,736), rejected claim 10 under 35 U.S.C. §103(a) as being unpatentable over the combined Muller et al. and Manning et al. in view of Nation et al. (United States Patent No. 7,301,906), rejected claim 11 under 35 U.S.C. §103(a) as being unpatentable over the combined Muller - Manning et al. in view of Davis (United States Publication No. 2007/0208876), rejected claim 12 under 35 U.S.C. §103(a) as being unpatentable over Muller - Manning et al. in view of Miller et al. (United States Patent No. 6,247,058), and rejected claim 24 under 35 U.S.C. §103(a) as being unpatentable over Muller et al. and Sindhu et al., in view of Manning et al.

25 Independent Claims 1 and 18

Independent claims 1 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Muller et al. (United States Patent No. 6,021,132) in view of Sindhu et al. Regarding claim 1, the Examiner asserts that Muller discloses storing at least a portion of a packet in contiguous banks of a first buffer (FIG. 3A, banks = buffer #1, buffer #2, buffer #3; 30 col. 8, lines 37-42). The Examiner acknowledges that Muller does not disclose that each of said one or more buffers comprises a plurality of banks, but asserts that Sindhu discloses one buffer

(FIGS. 2B and 9; col. 3, lines 39-40) and storing at least a portion of a packet in contiguous banks of a first buffer (col. 2, lines 40-45).

Applicants note that independent claims 1 and 18 have been amended to require *storing in said shared memory, wherein said shared memory comprises two or more buffers and two or more banks, at least a portion of a packet in contiguous banks of a first buffer of said two or more buffers, wherein each of said banks comprises portions, wherein each of said two or more buffers comprises a portion from each of said plurality of banks, and wherein each of said buffers identifies an address of a location in each of said banks.*

It is unclear if the Examiner is equating a “bank” with a single memory line or a number of memory lines. In the former case, it is noted that a “bank” is well known in the art to comprise more than one memory line, and that this interpretation would therefore be inappropriate. In the latter case, it is noted that, in the text cited by the Examiner, Muller teaches:

Referring now to FIG. 3A, a logical view of shared memory 230 is depicted having stored therein packet data in a number of buffers. In this example, the shared memory 230 is segmented into a number of buffers (pages) of programmable size. All the buffers may have the same size, or alternatively, individual buffer sizes may vary. In another embodiment, *the buffers may be further subdivided into a number of memory lines*. Each line may be used for storing packet data. In other embodiments, control information may also be associated with each of the memory lines. The control information may include information for facilitating efficient access of the packet data such as an end of packet field. The separation of control information and data increases the efficiency of accesses to and from the shared memory 230.

(Col. 8, lines 37-54; emphasis added.)

Applicants also note that Sindhu teaches a *single memory comprising a plurality of banks* (see FIG. 2b). Neither Muller nor Sindhu, alone or in combination, disclose or suggest that the *shared memory comprises two or more buffers and two or more banks, wherein each of the banks comprises portions, wherein each of the two or more buffers comprises a portion from each of the plurality of banks, and wherein each of the buffers identifies an address of a location in each of the banks.*

Thus, Muller et al. and Sindhu et al., alone or in combination, do not disclose or suggest storing in said shared memory, wherein said shared memory comprises two or more buffers and two or more banks, at least a portion of a packet in contiguous banks of a first buffer of said two or more buffers, wherein each of said banks comprises portions, wherein each of said

two or more buffers comprises a portion from each of said plurality of banks, and wherein each of said buffers identifies an address of a location in each of said banks, as required by independent claims 1 and 18, as amended.

Independent Claim 9

5 Independent claim 9 was rejected under 35 U.S.C. §103(a) as being unpatentable over Muller et al. in view of Manning et al. In particular, the Examiner asserts that Muller discloses maintaining a buffer usage count for at least one of said buffers in a shared memory (Abstract; col. 7, lines 25-27; and col. 9, lines 35-37). The Examiner asserts that Muller discloses a counter for monitoring a buffer usage count (Abstract; usage count) provides an 10 indication of the input (write) over all packets in said at least one of said buffers of the number of output ports (two output ports) toward which each of said packet is destined (col. 12, lines 27-31). The Examiner acknowledges that Muller is silent to disclosing a “sum over all packet in said at least one of said buffer,” but asserts that Manning discloses (that a) buffer provides an 15 indication of the sum (col. 6, lines 20-35; total number of cells) over all packets in said at least one of said buffers of the number of output ports toward which each of said packets is destined, wherein said at least one of said buffers contains two or more packets (col. 6, lines 25-35; and col. 13, lines 15-25).

Applicants note that the present specification teaches:

20 Another aspect of the invention provides techniques for managing the shared memory. A buffer usage count is maintained for at least one of the buffers. The buffer usage count provides an indication of the sum over all packets in a buffer of the number of output ports toward which each of the packets is destined. The buffer usage count provides a mechanism for determining when a buffer is free. In one implementation, the buffer usage count is incremented to indicate that a packet destined for one output port is stored in the buffer and is decremented when a data unit is read from the buffer and the data unit is the last data unit of a packet or the last data unit of the buffer. The buffer usage count can also indicate a number of destination ports for a packet to perform a multicasting operation.

25 30 (Page 2, lines 21-29; emphasis added.)

Thus, if a packet is destined for three output ports, the buffer usage count for this packet would be three. In accordance with this teaching, independent claim 9, as amended, requires wherein said buffer usage count provides an indication of a sum over all packets in said at least one of said buffers of a number of output ports toward which each of said packets is destined, wherein said at least one of said buffers contains two or more packets and wherein at

least one of said two or more packets is destined for more than one output port. In the text cited by the Examiner, Muller teaches:

The buffer tracking unit 329 processes the input port's 0010b notification which indicates there are 3 buffer owners.

5 Read: 1110b

Modify: $1110b + 0011b + 0001b = 0010b$

Write: 0010b

The other two output ports 206 complete transmission of 0010b the buffer and so notify the buffer tracking unit 329.

10 (Col. 12, lines 27-31.)

Muller does not disclose or suggest, however, that the buffer usage count provides an indication of a sum over all packets in the buffer of a number of output ports toward which each of the packets is destined and wherein at least one of the packets is destined for more than one output port. (Note that packets indicates that the sum is over two or more packets.) In fact, Muller does not even disclose or suggest that the buffer usage count provides an indication of a sum over all packets.

Also, in the text cited by the Examiner, Manning teaches:

Thereby, flow control and non-flow control connections can be active simultaneously.

20 When a data cell is forwarded out of the receiver element 14, Buffer_Counter 32 is decremented. Buffer_Counter 32 should never exceed Buffer_Limit 30 when the connection-level flow control protocol is enabled, with the exception of when BS_Limit 24 has been decreased and the receiver element 14 has yet to forward sufficient cells to bring Buffer_Counter 32 below Buffer_Limit 30.

25 A buffer state update occurs when the receiver element 14 has forwarded a number of data cells equal to N2_Limit 34 out of the receiver element 14. In the first embodiment in which the DP 18 maintains Fwd_Counter 38, update involves the transfer of the value of Fwd_Counter 38 from the receiver element 14 back to the transmitter element 12 in an update cell, as in FIG. 6A.

30 (Col. 6, lines 20-35.)

Manning teaches that Buffer_Counter 32 "provides an indication of the number of buffers 28 in the downstream element 14 which are currently being used for the storage of data cells. As described subsequently, this value is used in providing the upstream element 12 with a more accurate picture of buffer availability in the downstream element 14" (col. 4, line 66, to col. 5, line 4) and that Fwd_Counter 38 is "a running count of the total number of cells forwarded through the receiver element 14" (col. 5, lines 20-21). Thus, Manning also does not

disclose or suggest that the buffer usage count provides an indication of a sum over all packets in the buffer of a number of output ports toward which each of the packets is destined and wherein at least one of the packets is destined for more than one output port. (Note that packets indicates that the sum is over two or more packets.) In fact, Manning does not even
5 disclose or suggest that the buffer usage count provides an indication of a sum over all packets.

Thus, Muller and Manning, alone or in combination, do not disclose or suggest wherein said buffer usage count provides an indication of a sum over all packets in said at least one of said buffers of a number of output ports toward which each of said packets is destined, wherein said at least one of said buffers contains two or more packets and wherein at least one of
10 the packets is destined for more than one output port, as required by independent claim 9, as amended.

Dependent Claims 2-8, 10-14 and 19-24

Claims 2-8, 10-14, and 19-24 are dependent on independent claims 1, 9, and 18, respectively, and are therefore patentably distinguished over Muller et al., Manning et al.,
15 Benson et al., Kamaraj et al., Beshai, Lavelle et al., Sindhu et al., Nation et al., Davis, and Miller et al., alone or in combination, because of their dependency from amended independent claims 1, 9, and 18 for the reasons set forth above, as well as other elements these claims add in combination to their base claim.

Conclusion

20 All of the pending claims following entry of the amendments, i.e., claims 1-13 and 18-24, are in condition for allowance and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

The Examiner's attention to this matter is appreciated.

Respectfully submitted,

/Kevin M. Mason/

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